IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

| | | |
|---|---|---|
| Appl. No. | : | 10/543,180 |
| Confirmation No. | : | 5597 |
| Applicant | : | Stefan Deiss |
| Filed | : | 01/05/2006 |
| Title | : | METHOD FOR ADDING RAW MATERIALS DURING THE PRODUCTION OF POLYESTERS OR COPOLYESTERS |
| TC/A.U. | : | 1796 |
| Examiner | : | Gennadiy Mesh |
| Docket No. | : | 041165-9089-00 |

Electronically filed by Sally Sorensen on March 4, 2009

**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

Mail Stop AF
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

In response to the final Office action mailed December 4, 2008 (the "Office action"), Applicants submit this Pre-Appeal Brief Request for Review. This response is accompanied by a Notice of Appeal and is submitted by the deadline of March 4, 2009. Authorization to charge the appropriate fees is provided with this response. In the event of underpayment of any required fee, please charge Deposit Account 13-3080.

**Status of the Claims**

Claims 1-8 are pending. Claims 1-8 stand rejected under 35 U.S.C. § 103(a) as being obvious over Japanese Patent No. 06-247899 issued to Yasuo et al. ("Yasuo") in view of U.S. Patent No. 4,327,759 issued to Millis.

**The Invention**

The present invention provides a method for producing pastes from solid and liquid raw materials that are used in the manufacture of polyesters. The invention requires that the charging rate of solid raw material is controlled based on the deviation of the density of the prepared paste from a set-point value. Prior to Applicants' invention, the amounts of solid raw

materials were conventionally introduced to the reaction by direct weighing. As set forth in the specification, use of a weighing machine leads to inaccuracies, as a gradual drift in the zero-point occurs, based on the residual moisture in the solid material. *See* page 2, 3rd full paragraph. Accordingly, Applicants' invention represents a significant valuable contribution to the art.

**The References Fail to Teach or Suggest Controlling the Charging Rate of the Solid Raw Material**

The Examiner contends that Yasuo teaches or suggests the inventions of claims 1-8 in view of evidence by Millis. However, the cited references, taken separately or combined, do not teach or suggest control of the charging rate of the solid raw material based on the deviation of the density of the prepared paste from a set point value, as required by claim 1.

Yasuo describes, in the production of bis(hydroxyethyl) terephtalate (BHET), use of a liquid densitometer to monitor the molar ratio of solid (terephthalic acid; TPA) and liquid (ethylene glycol; EG) raw materials. In the non-final Office action, dated August 4, 2008, the Examiner alleged that Yasuo anticipated claims 1 to 8, or alternatively that the claims were obvious over Yasuo in view of Millis, alleging that Millis cured Yasuo's failure to teach closed loop control. However, as Applicants indicated in the response, Yasuo repeatedly teaches that the speed of supply of the EG liquid raw material should be adjusted based on the molar ratio, and does not teach or suggest controlling the charging rate of the solid raw material. *See* Yasuo at paragraphs 15, 16 and 19. In the final Office action, dated December 4, 2008, the anticipation rejection was withdrawn. Nonetheless, essentially improperly making a new rejection in a final Office action, the Examiner now summarily concludes that it is obvious to do so because "the density of the slurry is function of molar ratio between TPA and EG, and can be control [sic] by changing the feeding rate of TPA or EG or both." Office action, page 2, part 1, lines 9-14.

Contrary to the Examiner's new opinion, it was not obvious prior to Applicants' invention, to one of ordinary skill in the art to adjust the molar ratio between TPA and EG by controlling the charging rate of the solid raw material TPA.

Due to inaccuracies in measuring the supply of solid raw material, prior to Applicants' invention it was common either to prepare the paste in batches, i.e., by weighing a predetermined amount of TPA and mixing it with a corresponding amount of EG, or to control the charging rate of the liquid raw material, as taught by Yasuo, in a continuous preparation process.

The Examiner appears to suggest that Yasuo, at paragraph 3, recognized the possibility to control the supply of the solid raw materials, but that the method could lack accuracy. Office action, page 4, lines 12-13. However, this disclosure is not a suggestion to use a closed loop control system to control the supply of solid material, not least because solid raw material could be supplied using other techniques such as periodic weighing. In fact, Yasuo at paragraph 3 merely characterizes an existing problem in the art of adjusting the desired molar ratio of TPA and EG, due to inaccuracies in measuring the supply of TPA by weighing. A careful reading of Yasuo indicates that it discloses that weighing of solid raw material and measuring the supply of TPA is the problem to be solved by controlling the charging rate of the liquid raw material. If anything, therefore, Yasuo teaches away from controlling the supply of solid raw material according to claim 1, by suggesting that it is difficult to do so accurately.

Millis fails to cure the deficiencies of Yasuo. Specifically, Millis also fails to teach or suggest controlling the charging rate of the solid raw material. Rather, like Yasuo, Millis discloses that the rate of the liquid material should be controlled: "A liquid control circuit . . . generates a feed-back signal for controlling the actual rate of flow of liquid material into the closed circuit . . . . " Millis at abstract.

Neither Yasuo or Millis, taken alone or in combination, teach or suggest a method in which the charging rate of solid raw material is controlled, as recited in Applicants' independent claim 1, and accordingly the obviousness rejection cannot stand.

**The References Fail to Teach or Suggest Closed Loop Control of the Charging Rate of Materials in the Production of Paste for the Manufacture of a Polyester**

Not only does Yasuo fail to teach or suggest any control of the charging rate of the solid raw material as discussed above, it also fails to disclose closed-loop control of the charging rate of the solid raw material, according to claim 1. The Examiner concedes this: "Yasuo [does] . . . not explicitly disclose[s] automated closed-loop control." Nonetheless, the Examiner alleges that it would be obvious to use closed loop control of the solid raw material based on Millis' disclosure "that this closed-loop automated process can be used in order to prepare slurry . . . wherein desirable density can be achieved." Office action, page 3, lines 4-6. However, Millis fails to teach anything about controlling the flow rate of the solid material, let alone closed loop control of the solid material. Rather Millis discloses closed loop control of the rate of flow of the liquid material. Abstract. Neither reference teaches or suggest closed loop control of the solid raw material according to claim 1.

Without the benefit of hindsight, there is simply no motivation to first modify Yasuo to control the charging rate of the solid raw material, and then also to use closed loop control to do

so. *See In re Fine*, 837 F.2d 1071, 1075 (Fed. Cir. 1988) (holding hindsight reconstruction of the claimed invention improper). With no motivation to modify Yasuo and combine the modified teachings with Millis, the rejection cannot be sustained.

**The Invention Provides Unexpected Advantages Which are not Taught or Suggested by the Cited References**

Furthermore, claims 1-8 are not obvious because there are numerous unexpected advantages of the present invention, set forth in the specification, which are not taught or suggested by the cited references. These advantages include at least one of: (i) a reduction in energy costs achieved, for example, through mechanical homogenization of the starting materials or by permitting direct addition of hot recycled liquid raw material to the paste (page 3, last paragraph); (ii) the use of a reduced volume paste preparation container which shortens the system dead-time and facilitates changes in recipes (page 4, first paragraph); (iii) determination of the consumption of the solid raw material without the use of a weighing machine (page 6, sixth full paragraph).

Additionally, controlling the charging rate of the solid raw material according to claim 1 provides the further unexpected advantage that in the event of a system malfunction, a solidification of the paste is prevented. For example, if the supply of the liquid raw material is interrupted or discontinued, the paste density increases. In this case, claim 1 permits the supply of solid raw material to be down-regulated up to a complete stop, to avoid a solidification of the paste due to excessive feeding. In contrast, in both Yasuo and Millis, the system would attempt to increase the supply of the liquid raw material, whereas the solid raw material would continue to be supplied. Since the liquid supply is discontinued, however, the paste would solidify because of the continuing feeding of the solid raw material. These advantages are not taught or suggested by the prior art, and accordingly, claim 1 is not obvious over the cited references.

**Dependent Claims 2-8**

Claims 2-8 each depend from claim 1, and accordingly are allowable for at least the reasons set forth above. *In re Fine*, 837 F.2d 1071, 1076 (Fed. Cir. 1988). Claims 2-8 may be patentable for additional reasons not discussed herein. Claim 2 is also patentable for additional reasons set forth below.

Claim 2 requires that the setting of the molar ratio occurs without application of a weighing machine for the solid material, is not taught or suggested by either reference. As noted in the specification, "[t]he precise determination of the amount of solid starting materials . . . occurs in contrast in the previously known methods by weighing the powder raw material

before addition to the process." Page 2, 2nd full paragraph. The Examiner alleges that Yasuo does not rely on the use of a weighing machine (Office action, page 2, part 1, line 8), without providing any basis for that statement. As Applicants noted above, Yasuo teaches only control of the rate of flow of the liquid material, and contains no suggestion to set the molar ratio without using a weighing machine according to claim 2.

## CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance. Withdrawal of the rejections and allowance of claims 1-8 are therefore respectfully requested.

Respectfully submitted,

/lynda m fitzpatrick/

Lynda M. Fitzpatrick
Reg. No. 60,901

**File No. 041165-9089-US00**
Michael Best & Friedrich LLP
100 East Wisconsin Avenue, Suite 3300
Milwaukee, Wisconsin 53202-4108
414.271.6560

T:\CLIENTA\041165\9089\B1721247.0